



US009510930B2

(12) **United States Patent**
Patel et al.

(10) **Patent No.:** **US 9,510,930 B2**
(45) **Date of Patent:** **Dec. 6, 2016**

(54) **ANGIOPLASTY DEVICE WITH EMBOLIC FILTER**

(75) Inventors: **Udayan G. Patel**, San Jose, CA (US);
Ravish Sachar, Raleigh, NC (US)

(73) Assignee: **Contego Medical, LLC**, Raleigh, NC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 363 days.

(21) Appl. No.: **12/604,236**

(22) Filed: **Oct. 22, 2009**

(65) **Prior Publication Data**

US 2010/0106182 A1 Apr. 29, 2010

Related U.S. Application Data

(60) Provisional application No. 61/107,391, filed on Oct. 22, 2008, provisional application No. 61/107,395, (Continued)

(51) **Int. Cl.**

A61M 29/00 (2006.01)

A61F 2/01 (2006.01)

A61M 25/06 (2006.01)

(52) **U.S. Cl.**

CPC **A61F 2/013** (2013.01); **A61F 2002/016** (2013.01); **A61F 2002/018** (2013.01); **A61F 2230/0006** (2013.01); **A61F 2230/008** (2013.01); **A61F 2230/0067** (2013.01); **A61F 2230/0069** (2013.01); **A61F 2230/0093** (2013.01); **A61M 2025/0681** (2013.01)

(58) **Field of Classification Search**

CPC **A61F 2/01**; **A61F 2/013**; **A61F 2002/011**; **A61F 2002/016**; **A61F 2002/018**

USPC **606/108**, **198**, **200**; **604/104-107**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,723,549 A 2/1988 Wholey et al.

5,456,667 A 10/1995 Ham et al.

(Continued)

FOREIGN PATENT DOCUMENTS

DE 20 2005 022 063.9 11/2005

DE 202005022063 U1 3/2013

(Continued)

OTHER PUBLICATIONS

Baim, D.S., et al. Randomized trial of a distal embolic protection device during percutaneous intervention of saphenous vein aorto-coronary bypass grafts, *Circulation*, v. 105, pp. 1285-1290 (2002).

(Continued)

Primary Examiner — Gregory Anderson

Assistant Examiner — Sarah Simpson

(74) *Attorney, Agent, or Firm* — Meunier Carlin & Curfman LLC

(57) **ABSTRACT**

An angioplasty device has a filter associated with it to capture embolic particles that may be broken free during an angioplasty procedure. In one embodiment the embolic filter has a frame in which struts are connected to end rings and to each other by a plurality of interconnected oval members. In another embodiment the device includes an actuator at the proximal end of an actuator wire. By rotating a knob on the device, the physician can smoothly tension the wire by a predetermined amount to prevent the filter from opening too much or too little. Various other embodiments of filter frames are also disclosed.

16 Claims, 23 Drawing Sheets

